I CLAIM:

1. An apparatus for the continuous formation of composites comprising a mixture of filler and thermoactive materials, the apparatus comprising a conveyor for conveying a continuous charge of the mixture, and a hot-gas distribution system having at least one pair of gas cells positioned along the conveyor for applying hot gas to the charge, wherein a first cell of the pair applies hot gas to one side of the charge and wherein a second cell of the pair operates at a pressure less than that of the first cell, thereby creating a pressure differential across the charge, the second cell receiving gas expelled by the first cell.

2. The apparatus according to claim 1 having plural paired gas cells.

3. The apparatus according to claim 1 wherein the gas cells are rollers.

4. The apparatus according to claim 1 wherein the gas cells are stationary.

5. The apparatus according to claim 1 and further including a mixer for forming the mixture comprising filler material and thermoactive material and for providing a continuous charge of the mixture to the conveyor.

6. The apparatus according to claim 5 wherein the mixer includes a hot-gas inlet for receiving hot gas from a source for heating the filler material and the thermoactive material.

7. The apparatus according to claim 5 wherein the mixer comprises a cyclone mixer.

8. The apparatus according to claim 1 and further comprising baffles positioned adjacent the gas cells.

9. The apparatus according to claim 2 and further comprising baffles positioned adjacent at least one of the gas cells.

10. The apparatus according to claim 1 and further comprising shrouds positioned to substantially surround the gas cells.

11. The apparatus according to claim 2 and further comprising shrouds positioned to substantially surround at least one of the pairs of gas cells.

12. The apparatus according to claim 1 wherein the hot-gas distribution system comprises multiple pairs of cells, including cells for applying a densifying force to the charge, and wherein the pairs of cells are fluidly interconnected in series with a gas application cell of one pair connected to a suction or evacuation cell of same pair, with the suction or evacuation cell of one pair connected in series to press cell of another pair.

13. The apparatus according to claim 1 wherein such apparatus provides pulsed hot gas application to charge as charge moves between pairs of cells.

14. The apparatus according to claim 1 wherein the gas flows in a direction opposite to direction of charge movement through the consolidation zone.

15. The apparatus according to claim 1 wherein the gas flows in the same direction of charge movement through the consolidation zone.

16. The apparatus according to claim 1 wherein each cell is a drum-type roller.

17. The apparatus according to claim 16 wherein the rollers include central stationary gas application or recovery portion.

18. An apparatus for the continuous formation of composites comprising a mixture of filler and thermoactive materials, the apparatus comprising:

a conveyor for continuously moving a charge through a consolidation zone;

pairs of gas cells positioned on opposite sides of the charge, one cell of the each pair for injecting hot gas into the charge, the other cell of each pair for drawing gas through the moving charge.

19. The apparatus according to claim 18 further comprising multiple pairs of cells.

20. The apparatus according to claim 19 wherein the multiple cells are fluidly interconnected.

21. The apparatus according to claim 19 wherein the multiple cells are interconnected in series.

22. The apparatus according to claim 19 wherein the multiple cells are interconnected in parallel.

23. The apparatus according to claim 18 wherein the gas flow direction is opposite to charge moving direction.

24. The apparatus according to claim 18 wherein the gas flow direction is the same as charge moving direction.

25. The apparatus according to claim 18 wherein the cells deliver pulses of hot gas to the moving charge.

26. The apparatus according to claim 1 wherein the cyclone heats a premixture of the filler and thermoactive material.

27. The apparatus according to claim 7 wherein the cyclone heats the mixture formed in the cyclone.

28. The apparatus according to claim 27 wherein the cyclone continuously heats and forms the mixture.

29. The apparatus according to claim 7 wherein the cyclone delivers a continuous charge to conveyor for continuous delivery to the consolidation zone.

30. The apparatus according to claim 1 comprising a continuous mixer for delivering a continuous charge to the conveyor for continuous delivery to the consolidation zone.

31. The apparatus according to claim 1 comprising a continuous mixer for continuously heating and forming a mixture, the continuous mixer continuously delivering a charge to the conveyor for continuous delivery to the consolidation zone.

32. A system for continuously forming a composite that includes thermoactive material and filler material, comprising:

a mixer for forming a mixture comprising filler material and thermoactive material;

a continuous consolidation apparatus for applying hot-gas to a charge, the apparatus comprising plural paired gas cells wherein a first cell of each pair applies gas to one major surface of a charge and wherein a second cell of each pair operates at a pressure less than that of the first cell, thereby creating a pressure differential across the charge, the second cell receiving gas passing through the charge; and

a densifying apparatus for applying a densifying pressure to the charge.

33. The system according to claim 32 and further including a mat-forming apparatus upstream of the consolidation apparatus.

34. The system according to claim 32 and further comprising a densifying apparatus upstream of the consolidation apparatus.

35. The system according to claim 32 wherein the densifying apparatus comprises the cells.

36. The apparatus according to claim 32 wherein the densifying apparatus comprises pressure cells for applying a densifying pressure to the charge.

37. The system according to claim 32 wherein the gas cells and densifying cells are the same cells.

38. The system according to claim 32 and further comprising densifying cells downstream of the gas cells.

39. The apparatus according to claim 32 wherein the densifying apparatus operates continuously.

40. The apparatus according to claim 32 wherein the densifying apparatus operates batchwise.

41. The apparatus according to claim 32 wherein the gas cells comprise press cells.

42. The apparatus according to claim 32 comprising press cells downstream of the gas cells.

43. The apparatus according to claim 32 for continuously consolidating and densifying the charge by applying pressure to the charge as it moves through the consolidation zone while simultaneously applying pressure to the charge.

44. The apparatus according to claim 32 further comprising a densifying apparatus upstream of the consolidation zone.

45. A system for making composites comprising at least one thermoactive material and at least one filler material, the system comprising:

a cyclone for forming mixtures comprising thermoactive and filler materials;

a mat-forming apparatus for forming mats from the mixture;

a continuous consolidation apparatus for receiving the mat, the consolidation apparatus having a hot-gas distribution system comprising plural paired rollers wherein a first roller of each pair applies gas to a charge and wherein a second roller of each pair operates at a pressure less than ambient; and

a densifying apparatus for applying a densifying pressure to the charge downstream of the consolidation apparatus.

46. The system according to claim 45 and further comprising a densifying apparatus upstream of the continuous consolidation apparatus.

47. A method for continuously forming composites, comprising:

forming a mixture comprising a waste thermoactive material and a waste filler material; and

continuously consolidating the mixture in a consolidation zone by applying a hot gas to the mixture.

48. The method according to claim 47 further comprising moving a charge of the mixture through the consolidation zone while applying gas to one side of the moving charge while exhausting gas from opposite side of the charge.

49. The method according to claim 48 and comprising applying gas at same position along path of moving charge that gas is exhausted from charge.

50. The method according to claim 48 wherein the charge is a fluff.

51. The method according to claim 48 wherein the charge is a preformed mat.

52. The method according to claim 48 wherein the charge is a densified preformed mat.

53. The method according to claim 48 wherein the charge is formed by heating and mixing filler and thermoactive material in the cyclone.

54. The method according to claim 48 and further comprising the step of densifying charge by applying pressure to consolidated charge.

55. The method according to claim 48 and further comprising densifying charge by applying pressure to charge while injecting hot gas into the charge.

56. The method according to claim 48 and comprising densifying charge to a first density by applying pressure to charge while injecting hot gas into the charge and thereafter densifying to a second greater density.

57. The method according to claim 48 wherein the step of continuously consolidating comprises applying hot gas to the charge using a hot-gas distribution system having plural paired gas cells wherein a first cell of each pair applies gas to a first major opposed surface of a charge and wherein a second cell of each pair receives hot gas on the opposite major opposed surface of the charge as the hot gas passes through the charge, the second cell operating at a pressure less than that of the first cell, thereby creating a pressure differential across the charge.

58. The method according to claim 48 wherein the filler material is cellulosic material.

59. The method according to claim 48 wherein the thermoactive material is a thermoplastic material.

60. The method according to claim 48 wherein the filler material is waste cellulosic material, and the thermoactive material is waste thermoplastic material.

61. The method according to claim 48 wherein the step of continuously consolidating the mixture comprises applying a hot, dry noncondensable gas to the mixture at a temperature of from about 100 F to about 600 F.

62. The method according to claim 48 wherein the mixture further includes materials selected from the group consisting of biocides, fungicides, fire retardants, conductive materials, pigments, water retardants, wax-like materials, coupling agents, crosslinking agents, and combinations thereof.

63. A method for continuously forming composites, comprising:

forming a mixture comprising waste thermoactive material and waste cellulosic material; and

continuously applying a hot, dry noncondensable gas to the mixture at a temperature of from about 100 F to about 600 F.

64. The method according to claim 63 wherein the step of continuously applying comprises continuously applying the gas to the mixture using a hot-gas distribution system having plural paired gas cells wherein a first cell of each pair applies gas to a charge and wherein a second cell of each pair receives air passing through the charge and operates at a pressure less than that of the first cell, thereby creating a pressure differential across the charge.

65. The method according to claim 63 wherein the mixture further includes materials selected from the group consisting of biocides, fungicides, fire retardants, conductive materials, pigments, water retardants, wax-like materials, coupling agents, and combinations thereof.

66. A thermoactive-cellulose composite product, comprising a filler material and a thermoactive material, the surface of the product being surface modified and having grafting chemicals attached thereto.

67. The composite product according to claim 66 wherein the thermoactive material is crosslinked.

68. The product according to claim 66 wherein the product further comprises a surface coating of a thermoactive or paper material.

69. The product according to claim 67 wherein the product further comprises a surface coating of a thermoactive or paper material.

70. A painted product according to claim 66.

71. A product made according to the method of claim 47.

72. A product made according to the method of claim 63.